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ABSTRACT

Thirty-two parent couples participated in this investigation to determine whether learning patterns established in the home environment significantly affect a child's later cognitive development in traditionally school-taught subjects. This research report outlines the methodology used in the study, explains the operational criteria for the four different kinds of knowledge considered, and tabulates the results of the experiment by means of percentage statistics. The differences between teacher-initiated and parent-initiated memory training techniques are discussed. The study concludes that preschool children have little exposure to mnemonic study techniques (even though the majority of parents feel that the formation of memorization skills should take place prior to school enrollment), and that the small amount of training that they do receive has a negligible effect on later memory performance. (LH)

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Family and Schooling Influences on Children's Memory Development

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Family and Schooling Influences on

Children's Memory Development

In recent years a great deal of research and theory in child development has been centered on children's memory development during the preschool and early school years. This research has shown that age-related improvements in children's recall and recognition memory performance are most marked during the five-to-seven year age period.

The question of why memory improvements occur with age and why they are most apparent between five and seven years is less clear. Most of the research suggests that year-to-year improvements in memory ability are not due to any physiological changes in the memory system itself. However, children within this age period show several general changes in cognitive task performance that may account for improved memory performance. On the one hand, they begin to shift from an impulsive disposition toward learning tasks to a more reflective disposition. Also, learning and memory researchers have demonstrated a tendency for children to show greater deliberateness in their approaches to formalized tasks, and correspondingly, a greater reliance on the use of previously learned skills and strategies to aid learning and memory. Finally, it is during this age period that children begin to attend to conceptual similarities existing among stimuli, and thus are able to direct their attention from individual units of stimuli to categories or classes of relevant stimuli, thereby increasing recall proficiency.

But there remains the question of why these changes occur during the five-to-seven year age period? A persistent argument in recent literature is that the development of these cognitive skills and tendencies is largely

a result of the demands that children encounter during the first few years of formal schooling. Even in some kindergartens, children in public schools are encouraged, not only to enjoy their learning materials, but more importantly, to act upon them in an efficient and accurate manner. There are facts to be learned, rules and explanations to be memorized, and a substantial number of skills to be learned and retained for future use. In several recent papers, Cole and Scribner (1975a, 1975b, 1975c) and Scribner and Cole (1973) have pointed out that in technological societies, the school represents the major cultural institution where remembering as a distinct activity or specialized skill, in and of itself (i.e., in isolation from possible applications) is routinely undertaken. Brown (1977) also follows this line of reasoning when discussing the development of memorization skills in children:

> "Outside the school setting, in unschooled populations including that of the preschool child, such activities (i.e., the learning of study and memory skills) are rarely if ever encountered. Deliberate remembering as an end in itself rather than as a means to achieve a meaningful goal is very much a school-inspired activity."

In view of these conclusions, it should not be surprising that one of the consistent differences between schooled and unschooled populations rests in the ability to reflectively and deliberately operate on learning materials, and as a result, to begin to use strategies for remembering as well as learning.

As reasonable as this "formal-schooling" argument may seem, it is only partially supported by existing data. Indeed, as Scribner and Cole and

Brown suggest, there is a good deal of observational evidence that the schools, even during the early primary grades, do force children to be concerned with the efficiency and accuracy of their learning and memory, and therefore, to be increasingly reflective and deliberate in their approaches to tasks. However, the argument implies further that such demands do not exist in the home environments of preschool children, and for this position there are few, if any, available empirical data. The fact of the matter is that very little is known about the nature of educational training occurring in the home of preschool and young school-age children. Thus, it became important for us to obtain information concerning the types of memorization experiences young children have in the home.

An alternative position to that taken by Scribner and Cole and Brown is that children's memory strategy behavior evolves as a gradual developmental process which begins well before the child enters school. Here it can be argued that although preschool children may not be required to learn strategies for remembering as ends in themselves, or to execute them at their own direction, preschool children are likely to become familiar with certain memory strategies and the facilitative effects these strategies have for memory through the normal course of learning experiences with parents in the home environment.

It was with this alternative position in mind that we began our research projects. Specifically, we wanted to assess how demanding are parents on the retention proficiency of their young children, the types of strategies parents use to teach their children to memorize factual information, and the types of information parents believe should be left up to the school, rather than the home, to teach their children to memorize. As a corollary

to the research on the parental expectations for children's memory behavior, we have also conducted a research project to examine carefully the methods by which teachers promote and require children's memorization of factual information on a day-to-day basis in the school.

We have approached these issues from two research directions. First, we have used a controlled observation procedure to examine the likelihood that parents familiarize their young children with mnemonic study strategies in the home environment. The procedure required mothers and fathers of three- and four-year-old preschoolers to help their children study pictured objects for an ensuing free-recall task administered by the investigator. It was assumed that if parents do expose their children to memory study strategies in the home, direct teaching should reflect these tendencies. This would argue that we analyze more closely the strategy references that parents make in informal learning situations in the home. A second objective was to determine which of the study strategies used by parents to help their children to learn are most beneficial for the young child at the time of recall.

To examine these issues, 32 parent couples and their children (one child per couple) participated in the study. Each of the three-year-old and four-year-old samples was composed of 16 children. Teachers described the families as being representative of middle- and upper-middle income and occupational levels where parents were likely to spend greater than average amounts of time interacting with their children at home. Scores on the Peabody Picture Vocabulary Test showed the children to be a brighter-than-average group, with a mean verbal IQ score of 120.

Teaching sesions were conducted in a large testing room adjacent to an

observation booth. Each parent was instructed to help his/her child to memorize a 20-item set of pictures of familiar objects so that when the investigator administered the free-recall task, the child would remember as many of the names of the objects as possible. When the parent felt the child was ready for the recall task, he/she signaled the investigator, who was seated in the observation booth and who then administered the free-recall task. Teaching sessions were tape recorded and later transcribed. The average session lasted eight minutes per dyad, although the length of individual sessions was highly variable.

In order to perform quantitative analyses, the verbal communications of each parent were first converted to message units, which are single meaningful statements or questions (Hess & Shipman, 1965; Davis & Lange, 1973). A preliminary survey of protocols indicated that the majority of the parent's communications centered on four strategies: a simple naming strategy in which the parent named items or asked the child to do so; an item elaboration strategy in which parents described unseen properties or locations associated with the objects or encouraged their children to do so through questions (e.g., "Where have you seen a fence like this around our house?" or "This is like the coat that Daddy wears."); a story elaboration strategy in which items were mentioned and discussed in a story context; and a grouping strategy in which parents assigned items to phonemic, perceptual or semantic groupings or asked the children to establish these groupings (e.g., "Find the outdoor things and put them on the table; now find the things that have sharp points."). Before going on, I should say that there is a good deal of evidence to suggest that the elaborative and grouping strategies are more effective for all age groups of verbal children than simple naming.

The first slide (Table 1) shows that the relative frequency of reference to the four study strategies was very similar and highly consistent for both mothers and fathers. Although nearly 70 percent of all parent messages could be classified as strategy-related, the only strategy frequently used by both mothers and fathers was that of simple naming. Fathers used significantly more of this naming strategy than did mothers in their communications, and this finding accounts for the fact that fathers also communicated more strategy-related messages. For those strategy references which did fall in the elaborative and grouping categories, nearly 80 percent appealed to the child's pre-acquired and sometimes personal knowledge of the objects rather than to knowledge of a more universal or generic nature. In fact, only two percent of total messages encouraged groupings on the basis of adult-like taxonomic criteria, such as "these are tools."

Children achieved similar levels of recall with both mothers and fathers serving as teachers, as can be seen in Table 2. Recall scores did increase with chronological age, and the number of items recalled by our samples at both age levels were substantially higher than those reported previously by Meyers and Permutter (in press) for same-age children under self-study instructions.

Our attempts to find relationships between the relative frequencies of parents' reliance on the four strategies and the children's recall scores were generally unsuccessful. In other words, there was no apparent connection between any of the teaching strategies parents used and the children's ability to remember the picture names afterward.

One possible explanation for this is that parents failed to get the children to actually use these strategies during the study session. To

examine this possibility, all strategy-related message units were recoded on the basis of whether they actually encouraged or required the children to operate on the items (i.e., to name, elaborate or group) themselves and as to whether the parents' attempts at encouraging the children to use these strategies were actually successful. As it turned out, less than 25 percent of all strategy-related communications actually encouraged the children to operate upon the items themselves, and there was not significant difference in the mean proportion of operative statements used by mothers and fathers. Of those statements which did encourage or require active study on the part of the child, only some were actually successful in getting the child to act upon the items by groupoing, elaborating or naming them.

These findings, at least for our sample, suggest that the young child is likely to acquire little experience with effective adult-like study and memory strategies wen interacting with parents, even in situations which involve direct teaching. Moreover, when parents do refer to elaborative and grouping strategies as a means to help their children remember, they make few attempts to have the children actually use the strategies in the way of self-study.

As a second means to explore the young child's memory experiences at home, we have conducted an interview-survey study of parents of three-, four- and five-year-olds from rural and metropolitan areas of Indiana. The survey instrument was designed to obtain information in the following areas:

1. The types of information parents encourage or demand their children to retain in the home environment from day to day.
2. The types of information which parents feel should be required for memorization in the schools but not in the home.

3. The manner in which paents put their memory expectations into practice.
4. The methods by which parents attempt to teach their children memory skills, either directly or indirectly, through games or other types of exercises.

If Brown's (1977) earlier mentioned statement is correct (i.e., that the learning of study and memory skills in the home is rarely if ever encountered), we would expect to find little evidence that parents actually demand or require their children to memorize factual information on a day-to-day basis in the home. We would also expect to find little evidence to suggest that parents devote much time to improving or teaching memory skills to their children, using such methods as "memory games" or repetition of the to-be-remembered material.

The survey-questionnaire was completed by 172 parents (64 fathers and 108 mothers). These parents represent 122 children ranging in age from three years, one month to five years, elevent months. Of the 122 children in our sample, 11 are three-year-olds, 50 are four-year-olds, and 61 are five-year-olds. There are 61 boys and 61 girls in the sample.

In order to assess the kinds of information that may be memorized at home, we constructed a list of 37 types of knowledge representing names of people and things, rules, explanations, and stories and phrases. Parents responded to each item on the basis of a five-category checklist. This checklist was designed to assess the degree to which memorization of a particular item was stressed. Parents could respond by checking one or any combination of the five checklist categories. The categories were:

1. The parent encourages his/her child to memorize a particular item of knowledge.

2. The parent requires the child to memorize a particular instance.
3. The parent deliberately teaches the child a particular instance of knowledge.
4. The parent believes that a particular item should be memorized at school, but not by preschoolers in the home.
5. The child seems to like to memorize the information on his/her own.

The ways in which mothers and fathers responded to each general type of knowledge are shown in Figures 1 and 2. The majority of the parents responded that they encourage the memorization of the various types of knowledge by their children. The percentages of mothers and fathers who responded that they teach their children the various types of knowledge are less than those for encouragement, and it appears that very few parents actually require their children to memorize. It is interesting to note that the general category of "rules" was claimed to be both taught and required to a greater extent than the other categories by both mothers and fathers. It is also interesting to note the consistency with which mothers and fathers responded to the various types of knowledge in reference to the emphasis they place on the memorization of the information. This consistency is especially interesting in light of the consistency between parents that was found in the direct teaching study.

In terms of the types of information parents feel are the responsibility of the schools for memorization, most of the responses fell into the categories of explanations and stories and phrases. Parents were more likely to hold themselves responsible for the memorization of names and rules.

Sixty-two percent of all parents responded that they felt that memorization of factual information should be required of young children prior to entrance into school.

In order to provide a means for comparison for our parent sample, we have also conducted an interview-survey study of teachers of children in kindergarten, first, second and third grades. An instrument similar to the one distributed to our parent sample was completed by 82 teachers from central Indiana (16 kindergarten teachers, 25 first-grade teachers, 25 second-grade teachers, and 16 third-grade teachers). Fifty-six percent of the teachers were from rural areas and 44 percent were from urban areas of Indiana. In order for a teacher's responses to be used for comparison purposes, he/she had to have taught for at least one year in the state of Indiana.

Figure 3 shows the mean percentages of parents and teachers who responded that they either teach or require the memorization of the four types of knowledge. As can be seen from the graph, both parents and teachers indicate that they teach a great deal of the knowledge that we listed, and differences between parents and teachers were revealed when the various categories of knowledge were considered separately. For example, parents were more likely to say that they teach their children the names of family and friends and explanations of bodily functions, whereas teachers were more likely to respond that they teach their pupils such things as rules as to where to put objects when finished or the names of farm and zoo animals.

When the mean percentages of parents and teachers who responded that they require their children (or pupils) to memorize factual information are taken into consideration, it can be seen that the percentages for both groups are lower than the percentages for teaching. The percentages for teachers

are typically higher than those for the parents. The differences between parents and teachers for the requirement of memorization were revealed to be smallest for knowledge of the most basic nature and most apparent for knowledge of a more conceptual nature. Thus, it appears that while parents feel it is important to teach their children various types of information, very few parents actually require their children to memorize that information. The opposite appears to be true for teachers, that is, when teachers indicate that they teach a particular type of knowledge to their pupils, they are more likely to require their pupils to memorize that information.

We have also gathered information concerning the types of methods parents and teachers use to implement their memory expectations. Both groups responded to a list of 13 techniques that could possibly be used to put their memory expectations into practice with regard to the frequency to which they used the techniques. For example, some of the methods listed were the testing of a child's permanent memory, the use of repetition of the to-be-remembered information, and the grouping of items for memorization rather than the memorization of individual items. Teachers were more likely than parents to say that they use various techniques to help implement their memory expectations. For example, teachers were more likely to respond that they test their pupils permanent memory and to warn their pupils of the possibility that they will be tested. Teachers were also more likely than parents to say that they reward children for successful memorization and to provide prior knowledge to the children of reward for successful memorization. A trend was revealed in which second and third grade teachers were far more likely to have their pupils memorize items in groups rather than as single items than were kindergarten and first grade teachers.

Finally, we have information on teacher perceptions of children's memory deficiencies. The two major reasons given by teachers for their pupils' memory deficiencies were a lack of basic knowledge of memory strategies and a lack of motivation to store information with the intent to recall the information at a later time. Seventy-five percent of the teachers at both the kindergarten and first grade levels and the second and third grade levels reported that they make active attempts to teach memory strategies to their pupils. Kindergarten and first grade teachers responded that they make active attempts to help their classes with memory deficiencies on an average of ten times per month, while second and third grade teachers reported themselves to make active attempts on the average of eight times per month. The majority of teachers at both grade levels also claimed to focus on the teaching of memory skills both at the time content information is presented and also at the time when they can focus exclusively on the memory skills themselves. Teachers also mentioned that parents and peers are influential in fostering children's memory development.

The present findings do not bear on the effects of formal schooling, per se, on cognitive-strategy development, however, they do constitute one line of support for the view that young children are likely to gain little formal instruction in the use of effective mnemonic study strategies for verbal materials prior to the schooling period, at least not when interacting with parents.

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Table 1

Mean Percentages of Parents' Message Units in Each Strategy Category

	Child With Mother			Child With Father		
Strategies	3-yr-olds	4-yr-olds	Total	3-yr-olds	4-yr-olds	Total
Naming	43	36	39	52	46	49
Item Elaboration	16	12	14	12	13	12
Story Elaboration	02	04	03	01	04	02
Grouping	03	12	08	07	08	07
Total Strategy Usage	64	64	64	72	71	70

Table 2

Age Differences in Children's Recall With Mothers and Fathers

	Child With Mother			Child With Father		
Recall	3-yr-olds	4-yr-olds	Total	3-yr-olds	4-yr-olds	Total
Number of Pictures Recalled	5.00	7.31	6.16	4.81	7.50	6.16
Standard Deviation	3.27	3.93		2.37	2.76	

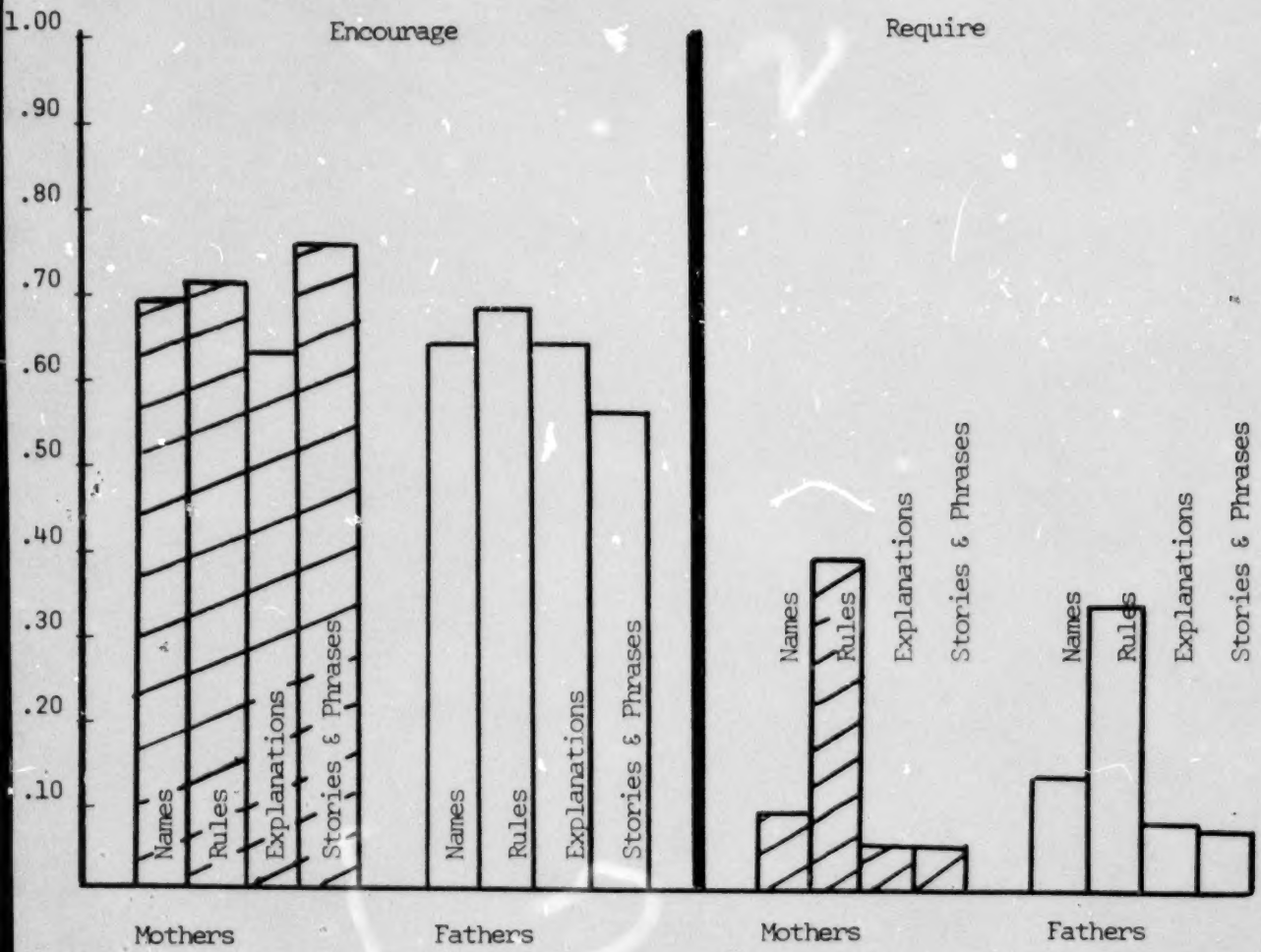

Figure 1. Mean percentages of mothers and fathers responding that they encourage or require the memorization of various types of knowledge.

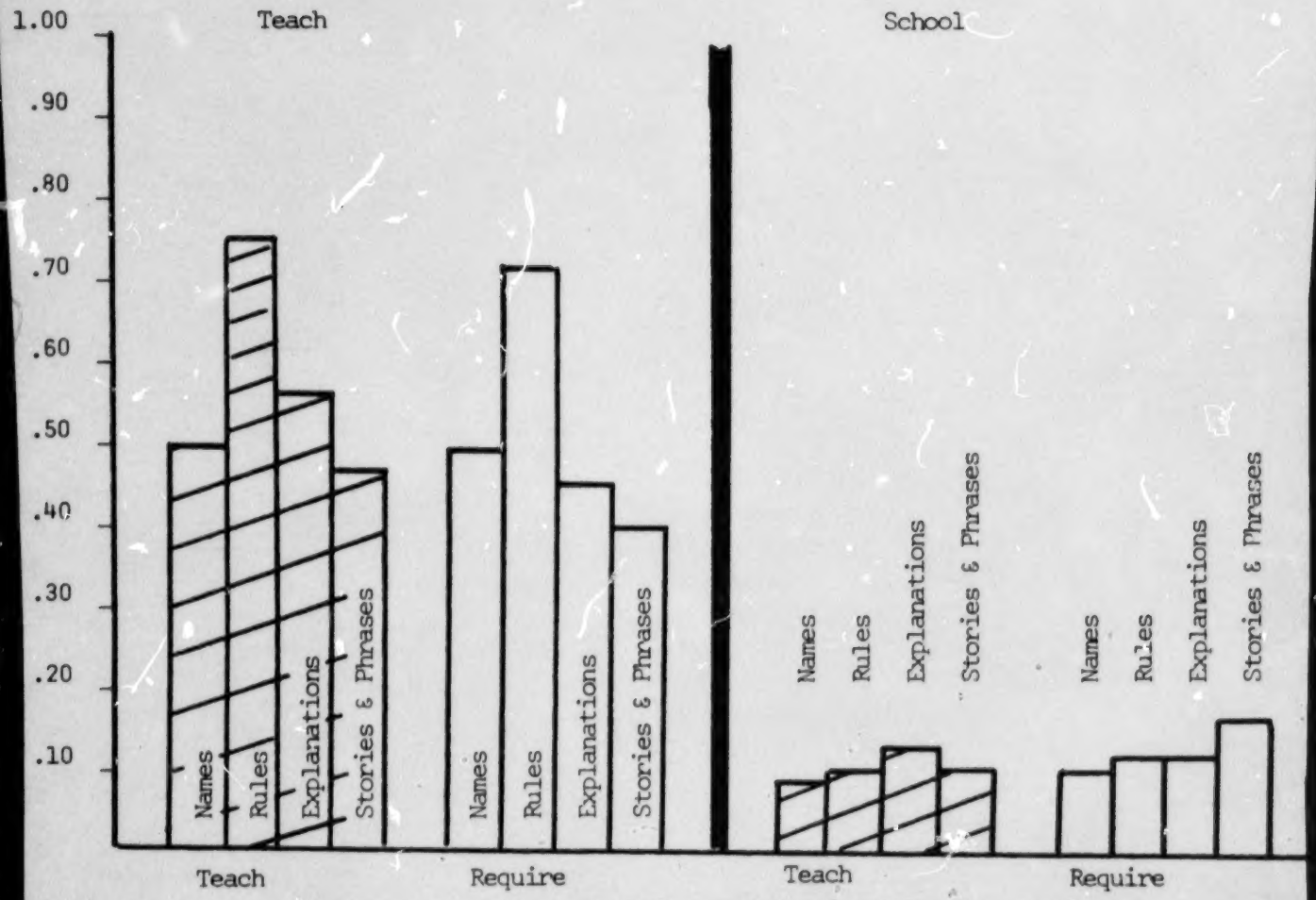

Figure 2. Mean percentages of mothers and fathers responding that they teach or feel that memorization should be left up to the schools for various types of knowledge

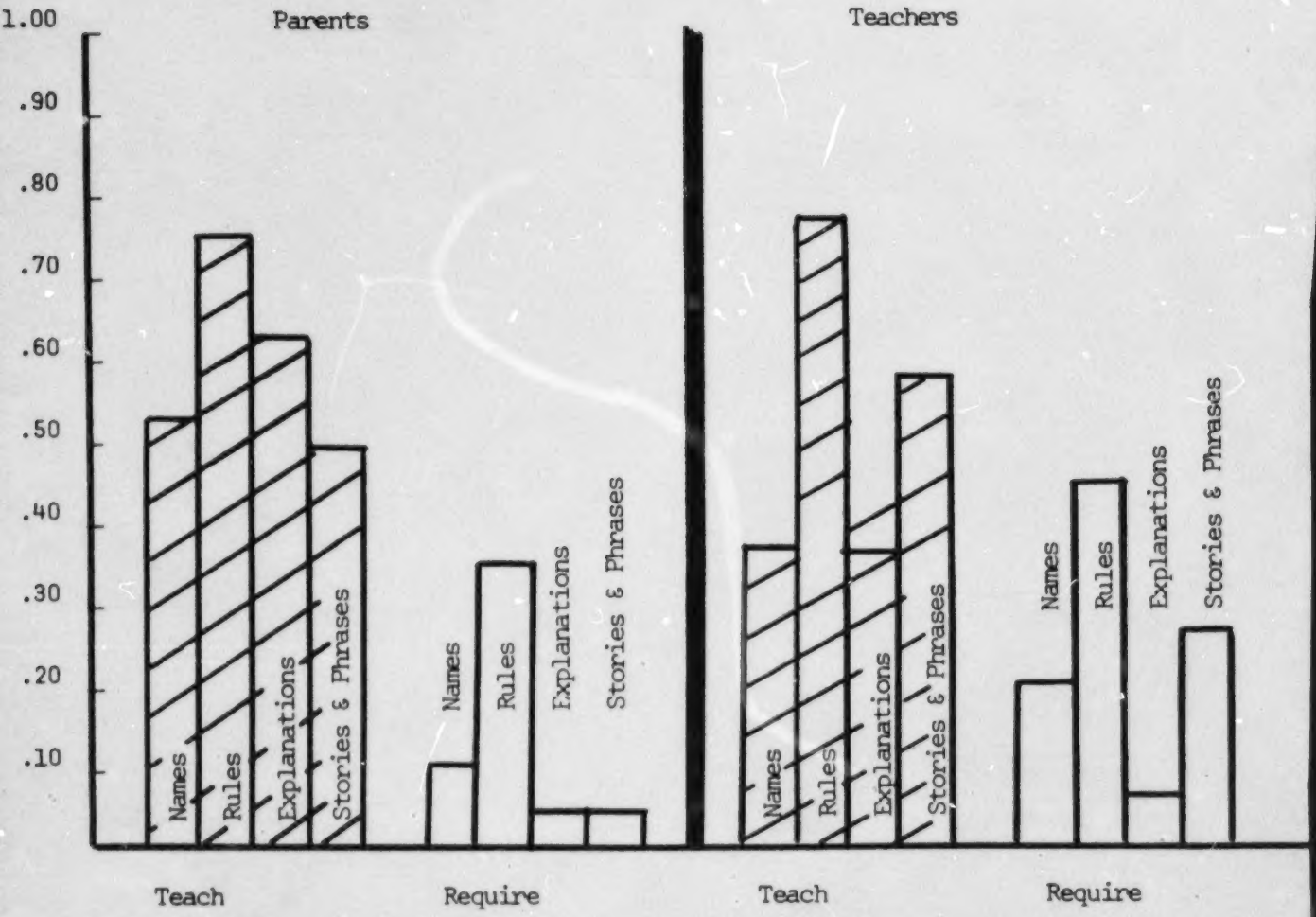

Figure 3. Mean percentages of parents and teachers responding that they teach or require the memorization of various types of knowledge.